

REMARKS

The final Office Action dated October 17, 2006, has been carefully reviewed, and in view of the above changes and following remarks reconsideration and allowance of all the claims pending in the application is respectfully requested.

Claims 1-35 stand finally rejected. By this response, claims 4-6 have been amended and previously withdrawn claims 36-50 have been canceled. New claims 51-55 have been added.

The Amendment To The Claims

Claims 4-6 have been amended. In particular, the preambles of claims 4-6 have been amended for consistency with claim 1. The amendments to claims 4-6 are directed to formal matters and do not narrow the scope of the amended claims. Therefore, no prosecution-history estoppel results from these amendments.

The Rejection Under 35 U.S.C. § 102(b) Over Odagawa

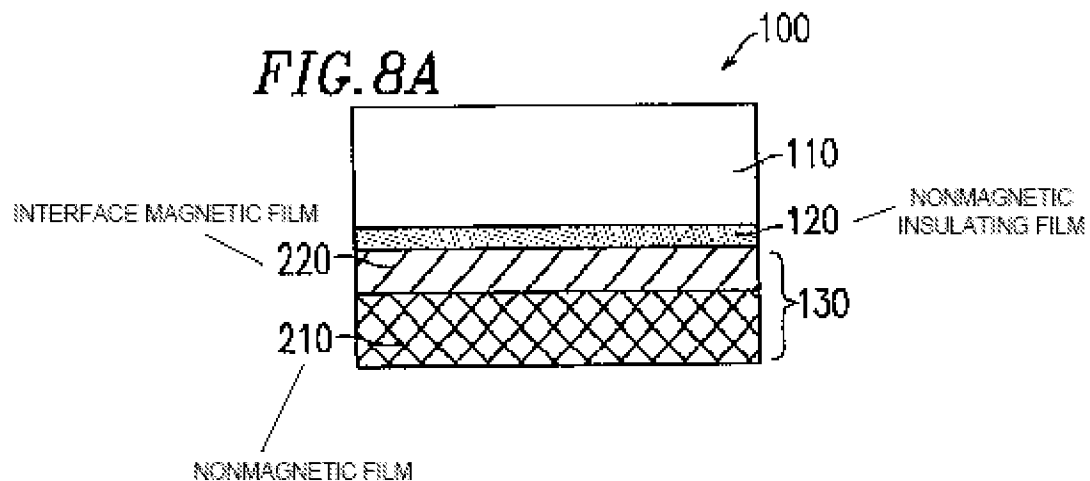
Claims 1-7, 10-16 and 22-35 stand finally rejected under 35 U.S.C. § 102(b) as anticipated by Odagawa et al. (Odagawa), U.S. Patent No. 6,436,526.

Applicants respectfully traverse this rejection. In that regard, Applicants respectfully submit that the subject matter of any of claims 1-7, 10-16 and 22-35 is not anticipated by Odagawa.

Regarding claim 1, Applicants respectfully submit that Odagawa does not anticipate the subject matter of claim 1. While the Examiner states that Odagawa discloses “in figure 8A a magnetic tunnel element comprising a first layer 210 formed from an amorphous material (col. 3, lines 59-61 and col. 27, lines 41-45)”, Applicants respectfully submit that the cites to Odagawa relied on by the Examiner for this rejection are ambiguous and do not anticipate the claimed subject matter of any of claims 1-7, 10-16 and 22-35.

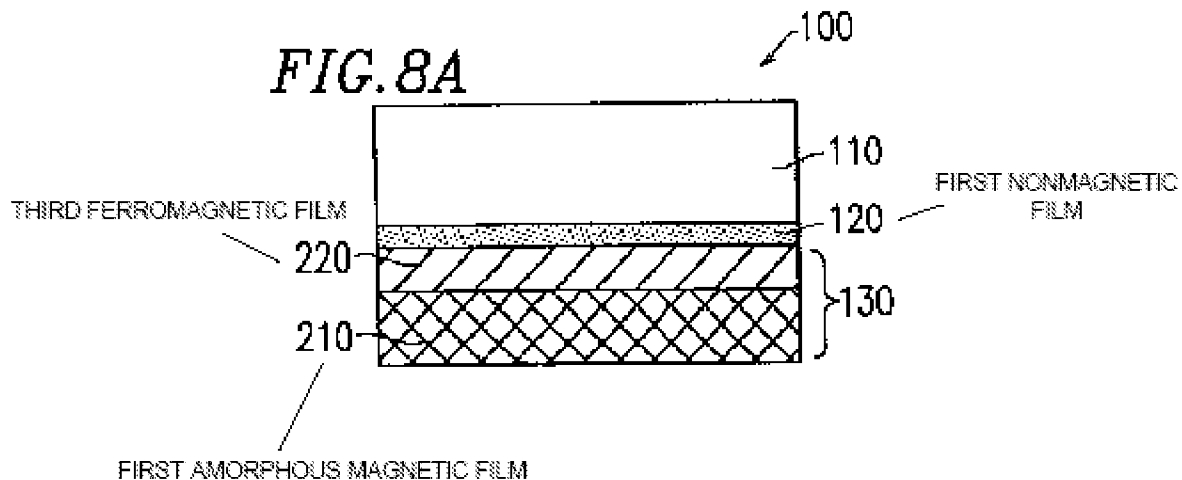
More specifically, Figure 8A of Odagawa, which is described at column 22, lines 18-39, discloses a magnetic tunnel element having an interface magnetic film 220 in contact with a nonmagnetic insulating film 120 and a nonmagnetic film 210. The Figure below depicts this

particular disclosure of Odagawa. Applicants respectfully note that column 22, lines 18-39, of Odagawa discloses nothing regarding nonmagnetic film 210 being amorphous.



ODAGAWA, COLUMN 22, LINES 18-39

Applicants respectfully submit that the disclosure cited by the Examiner at column 3, lines 59-61, of Odagawa refers to an embodiment that is also disclosed at column 3, lines 47-52. The embodiment disclosed at column 3, lines 47-52, of Odagawa includes a first ferromagnetic film that includes an amorphous magnetic film, and a third ferromagnetic film that is in contact with a first non-magnetic film and interposed between the amorphous magnetic film and the first non-magnetic film. Assuming that the disclosure at column 3, lines 47-52, of Odagawa are applicable to Figure 8a, the figure below depicts the disclosure at column 3, lines 47-52.



ODAGAWA, COLUMN 3, LINES 47-52

Referring back to the disclosure at column 3, lines 59-61, of Odagawa, the portion specifically cited by the Examiner, the amorphous magnetic film (film 210) is disclosed to include at least magnetic film selected from the group consisting of CoFeB and CoMnB. Hence, the cited portion at column 3, lines 59-61, is consistent with the disclosure at column 3, lines 47-52, in that film 210 is a magnetic film.

The ambiguity between the disclosures at column 22, lines 18-39 and column 3, lines 59-61, of Odagawa is plainly illustrated in the difference between the two figures above. That is, the plain difference is that in top figure above, film 210 is nonmagnetic, while in the bottom figure above, film 210 is magnetic. Further, the nothing is disclosed by Odagawa within column 22, lines 18-39, that nonmagnetic film 210 is amorphous, while column 3, lines 59-61, discloses an amorphous magnetic film. Thus, the only conclusion that is possible based on column 22, lines 18-39, and column 3, lines 58-61, is that the two cited portions of Odagawa are referring to two different and separate embodiments.

Regarding the Examiner's cite to column 27, lines 41-45, of Odagawa, Applicants respectfully note that column 27, lines 41-45, only discloses that ferromagnetic film 210 is formed to be CoMnB. Thus, the Examiner has cited an embodiment having a magnetic film 210,

which is inconsistent with the embodiment described at column 22, lines 18-39. Accordingly, there is an ambiguity between the disclosure at column 27, lines 41-45, and column 22, lines 18-39. The only correct conclusion that can be formed is that these two cited portions of Odagawa are referring to two different and separate embodiments.

Thus, the Examiner has not established a *prima facie* case of anticipation of claim 1. Instead, the Examiner has identified several portions of Odagawa that appear to be similar to the claimed subject matter of claim 1, but when properly considered do not together anticipate the subject matter of claim 1.

Further, Applicants respectfully submit that Odagawa does not suggest the subject matter of claim 1. It is respectfully noted that the Examiner has also not pointed out with any specificity where Odagawa discloses that the disclosures at column 22, lines 18-39, column 3, lines 59-61, and column 27, lines 41-45, are the same embodiment or can be combined to be the same embodiment. In this regard, it is respectfully noted that the disclosure at column 22, lines 18-39, are labeled “Example 5”; the disclosure at column 3, lines 59-61, is completely unidentified, and the disclosure at column 27, lines 41-45, is labeled “Example 8.” Accordingly, the Examiner is expressly invited to identify with specificity:

- (1) where Odagawa discloses that the embodiments disclosed at column 22, lines 18-39, column 3, lines 59-61, and column 27, lines 41-45, are the same and not different and separate; and/or
- (2) where Odagawa discloses and/or suggests that the embodiments disclosed at column 22, lines 18-39, column 3, lines 59-61, and column 27, lines 41-45, can be combined.

Thus, claim 1 is allowable over Odagawa. It follows that claims 2-7, 10-16 and 22-24, which each incorporate the limitations of claim 1, are each allowable over Odagawa for at least the same reasons that claim 1 is considered allowable.

Regarding claim 25, Applicants respectfully submit that claim 25 is not anticipated by Odagawa for reasons that are similar to the reasons that claim 1 is considered allowable. More

specifically, the ambiguous portions cited by the Examiner together do not establish a *prima facie* case of anticipation of claim 25, as demonstrated above in connection with claim 1.

Thus, claim 25 is allowable over Odagawa. It follows that claim 26, which incorporates the limitations of claim 25, is allowable over Odagawa for at least the same reasons that claim 25 is considered allowable.

Regarding claim 27, Applicants respectfully submit that claim 27 is not anticipated by Odagawa for reasons that are similar to the reasons that claim 1 is considered allowable. More specifically, the ambiguous portions cited by the Examiner together do not establish a *prima facie* case of anticipation of claim 27, as demonstrated above in connection with claim 1.

Thus, claim 27 is allowable over Odagawa. It follows that claims 28-35, which each incorporate the limitations of claim 27, are each allowable over Odagawa for at least the same reasons that claim 27 is considered allowable.

Consequently, Applicants respectfully request that the Examiner withdraw this rejection and allow claims 1-7, 10-16 and 22-35.

The Rejection Under 35 U.S.C. § 103(a) Over Odagawa In View Of Parkin

Claim 8 stands finally rejected under 35 U.S.C. § 103(a) as unpatentable over Odagawa in view of Parkin, U.S. Patent No. 5,341,188.

Applicants note that the final rejection of claim 8 is stated to be based on “Odagawa et al. in view of Parkin (US 5,341,188).” (See final Office Action, page 6, lines 17-18.) After review, Applicants conclude and respectfully submit that the patent number stated by the Examiner for the patent to Parkin et al. is in error and should actually be U.S. Patent No. 5,801,984. Applicants’ conclusion is based on the fact that none of the other patents to Parkin or Parkin et al. that have been made of record in the present patent application include a Figure 5 showing a layer 150. Accordingly, Applicants’ remarks that follow are as if the stated rejection is based on Odagawa in view of Parkin, U.S. Patent No. 5,801,984. If Applicants are incorrect in their conclusion regarding the particular patents on which the Examiner has based the rejection of

claim 8, Applicants respectfully request that the Examiner issue another Office Action stating the correct basis for rejection.

Thus, Applicants respectfully traverse this rejection and submit that the subject matter according to claim 8 is patentable over Odagawa in view of Parkin, U.S. Patent No. 5,801,984, because:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (See, also, MPEP §§ 706.02(j) and 2143.)

Regarding the first basic criterion for establishing a *prima facie* case of obviousness, Applicants respectfully submit that contrary to the Examiner's statement, there simply is no suggestion in Odagawa or Parkin "to modify Odagawa et al. by having metal containing layer in contact with the tunnel barrier layer and a semiconductor layer in contact with the first layer to obtain high spin filtering efficiency of a magnetic tunnel element." (See final Office Action dated October 17, 2006, page 7, lines 1-4.) The Examiner admits that Odagawa lacks such a suggestion by admitting that Odagawa does not teach "a metal containing layer in contact with the tunnel barrier layer and a semiconductor layer in contact with the first layer." (See final Office Action dated October 17, 2006, page 6, lines 20-21.) Moreover, the Examiner fails to identify where Odagawa makes such a suggestion for combination with Parkin.

Accordingly, if such a suggestion or motivation for the combination of Odagawa and Parkin were to exist, such a suggestion or motivation must necessarily be provided, in this case, by Parkin. In this regard, the Examiner states "Parkin discloses on figure 5 a metal containing

layer 150 in contact with the tunnel barrier layer (via conductive layer 132) and a semiconductor layer 114 in contact with the first layer 117.” (See final Office Action dated October 17, 2006, page 6, line 21, through page 7, line 1.) Applicants respectfully submit that it is erroneous to conclude based on the Examiner’s statement regarding Parkin that Parkin suggests “to modify Odagawa et al. by having metal containing layer in contact with the tunnel barrier layer and a semiconductor layer in contact with the first layer to obtain high spin filtering efficiency of a magnetic tunnel element.” Further, the Examiner has not identified with any specificity where Parkin suggests such a modification. Further still, Applicants respectfully submit that the Examiner’s statement that “Parkin discloses on figure 5 a metal containing layer 150 in contact with the tunnel barrier layer (via conductive layer 132) and a semiconductor layer 114 in contact with the first layer 117” plainly indicates that Parkin makes no such suggestion for combination with Odagawa. [Emphasis added.]

Even further, Applicants respectfully submit that Parkin does not cure the ambiguous nature of the portions of Odagawa cited and relied on by the Examiner as the basis for the rejection of claim 1, the base claim of claim 8. In particular, Parkin does not disclose or suggest that the embodiments disclosed at column 22, lines 18-39, column 3, lines 59-61, and column 27, lines 41-45, of Odagawa are the same or can be combined.

Thus, Applicants respectfully submit that the proffered combination of Odagawa and Parkin is formed by impermissible hindsight because neither Odagawa nor Parkin suggests the proffered combination.

Regarding the third basic criterion for establishing a *prima facie* case of obviousness, Applicants respectfully submit that even if the proffered combination of Odagawa and Parkin is formed, the resulting device is not the subject matter according to claim 8.

Regarding claim 8, Applicants respectfully submit that neither Odagawa nor Parkin disclose or suggest the claimed metal-containing layer in contact with the tunnel barrier layer. The Examiner admits that Odagawa does not teach “a metal containing layer in contact with the tunnel barrier layer and a semiconductor layer in contact with the first layer.” (See final Office Action dated October 17, 2006, page 6, lines 20-21.) Regarding Parkin, the Examiner states

“Parkin discloses on figure 5 a metal containing layer 150 in contact with the tunnel barrier layer (via conductive layer 132) and a semiconductor layer 114 in contact with the first layer 117.” (See final Office Action dated October 17, 2006, page 6, line 21, through page 7, line 1, emphasis added) The Examiner’s statement is plainly in contrast to claim 8 which comprises a metal-containing layer in contact with the tunnel barrier layer.

Thus, claim 8 is allowable over Odagawa in view of Parkin.

Consequently, Applicants respectfully request that the Examiner withdraw this rejection and allow claim 8.

The Rejection Under 35 U.S.C. § 103(a) Over Odagawa In View of Onodera

Claim 9 stands finally rejected under 35 U.S.C. § 103(a) as unpatentable over Odagawa in view of Onodera et al. (Onodera), U.S. Publication No. 2002/0168550.

Applicants respectfully traverse this rejection. In that regard, Applicants respectfully submit that the subject matter according to claim 9 is patentable over Odagawa in view of Onodera because the Examiner has not established both the first and third basic criterion for establishing a *prima facie* case of obviousness.

Regarding the first basic criterion for establishing a *prima facie* case of obviousness, Applicants respectfully submit contrary to the Examiner's statement, there simply is no suggestion in Odagawa or Onodera “to modify Odagawa et al. by substitute [sic] Si (semiconductor) for Fe to form a semiconductor material layer in proximity with the tunnel layer since Fe and Si were art recognized equivalents [sic].” (See final Office Action dated October 17, 2006, page 7, lines 14-16.) Regarding Odagawa, the Examiner admits that Odagawa provides no such suggestion by admitting that “Odagawa et al. shows in figure 8A the layer 110 in proximity with the tunnel barrier layer 220, but the material of layer 110 is Fe compound (col. 17, lines 5-10), not semiconductor as claimed.” (See final Office Action dated October 17, 2006, page 7, lines 9-11.) Moreover, the Examiner fails to identify where Odagawa makes such a suggestion for combination with Onodera.

Thus, if such a suggestion or motivation for combination were to exist, such a suggestion or motivation must necessarily be provided, in this case, by Onodera. In this regard, the Examiner states “Onodera et al. teaches Fe and Si (semiconductor) can be alternatively employed (para [0089], lines 1-5).” (See final Office Action dated October 17, 2006, page 11-13.) Paragraph [0089] of Onodera states “[a]s material for use in forming the lining layer 3, particularly, Al, Al₂O₃ can be mentioned. Additionally, such a metal as Mg, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ge, Zr, Nb, Mo, W alloy or oxide of these materials and the like can be employed.” Applicants respectfully submit that the Examiner is taking the cited disclosure of Onodera out of context. What the Examiner neglects to mention when making the Examiner’s assertion is that Odagawa is directed to a magneto-resistance effect element, while Onodera is directed to a magnetic thin film recording medium. Applicants respectfully submit that the Examiner has not asserted that one of ordinary skill in the art would consider Odagawa and Onodera to be analogous art because such an assertion would be baseless. In this regard, Applicants respectfully submit that Odagawa and Onodera are not analogous art. Further, the Examiner neglects to mention that lining 3 of Onodera provides mechanical strength (see Onodera, paragraph [0205]) and corrosion resistance (see Onodera, paragraph [0206]) for the Onodera magnetic tape and has nothing to do with tunnel junctions.

Even further, Applicants respectfully submit that Onodera does not cure the ambiguous nature of the portions of Odagawa cited by the Examiner as the basis for the rejection of claim 1, the base claim of claim 9. In particular, Onodera does not disclose or suggest that the embodiments disclosed at column 22, lines 18-39, column 3, lines 59-61, and column 27, lines 41-45, of Odagawa are the same or can be combined.

Thus, Applicants respectfully submit that the proffered combination of Odagawa and Onodera is formed by impermissible hindsight because neither Odagawa nor Onodera suggest the proffered combination.

Regarding the third basic criterion for establishing a *prima facie* case of obviousness, Applicants respectfully submit that even if the proffered combination of Odagawa and Onodera is formed, the resulting device is not the subject matter according to claim 9. In particular,

Applicants respectfully submit that neither Odagawa nor Onodera disclose or suggest the claimed semiconductor material layer in proximity with the tunnel barrier layer. Regarding Odagawa, the Examiner admits that “Odagawa et al. shows in figure 8A the layer 110 in proximity with the tunnel barrier layer 220, but the material of layer 110 is Fe compound (col. 17, lines 5-10), not semiconductor as claimed.” (See final Office Action dated October 17, 2006, page 7, lines 9-11.) Regarding, Onodera, the Examiner has not shown with any specificity where Onodera discloses the claimed semiconductor material layer in proximity with the tunnel barrier layer.

Thus, claim 9 is allowable over Odagawa in view of Onodera.

Consequently, Applicant respectfully requests that the Examiner withdraw this rejection and allow claim 9.

The Rejection Under 35 U.S.C. § 103(a) Over Odagawa

Claims 17 and 18 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Odagawa.

This rejection is respectfully traversed. Applicants respectfully submit that the subject matter according to either of claims 17 and 18 is patentable over Odagawa. Accordingly, because claims 17 and 18 incorporate the limitations of claim 1, each of claims 17 and 18 is allowable for at least the same reasons that claim 1 is considered allowable.

Consequently, Applicant respectfully requests that the Examiner withdraw this rejection and allow claims 17 and 18.

The Rejection Under 35 U.S.C. § 103(a) Over Odagawa In View Of Saito

Claims 19-21 stand finally rejected under 35 U.S.C. § 103(a) as unpatentable over Odagawa in view of Saito et al. (Saito), U.S. Patent No. 6,556,473 B2.

This rejection is respectfully traversed. Applicants respectfully submit that the subject matter according to any of claims 19-21 is patentable over Odagawa in view of Saito.

Applicants respectfully submit that Saito does not cure the deficiencies of Odagawa with respect to claim 1, the base claim for each of claims 19-21.

Consequently, Applicant respectfully requests that the Examiner withdraw this rejection and allow claims 19-21.

Newly Added Claims

Claims 51-55 have been newly added. Support for newly added claims 51, 54 and 55 can be found throughout the specification, for example, at least at lines 9-14 of paragraph 42, lines 17-18 of paragraph 43, lines 1-22 of paragraph 44, lines 1-10 of paragraph 45 of the originally filed present patent application. Support for newly added claims 52 and 53 can be found throughout the specification, for example, at least at lines 1-9 of paragraph 49 and lines 11-12 of paragraph 55 of the originally filed present patent application.

Applicants respectfully submit that claims 51-55 are allowable for at least the same reason that their respective base claims are considered allowable.

Consequently, Applicants respectfully request that the Examiner allow new claims 51-55.

Applicants note that additional patentable distinctions between Odagawa, Parkin, Onodera and Saito and the rejected claims exist; however, the foregoing is believed sufficient to address the Examiner's rejections. Additionally, failure of Applicants to respond to a position taken by the Examiner is not an indication of acceptance or acquiescence of the Examiner's position. Instead, it is believed that the Examiner's positions are rendered moot by the foregoing and, therefore, it is believed not necessary to respond to every position taken by the Examiner with which Applicant does not agree.

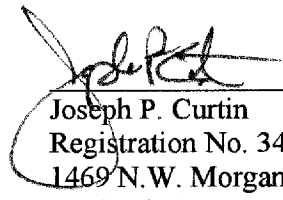
CONCLUSION

In view of the above amendments and arguments which present the claims in better form for consideration on appeal, it is urged that the present application is now in condition for allowance. Should the Examiner find that a telephonic or personal interview would expedite passage to issue of the present application, the Examiner is encouraged to contact the undersigned attorney at the telephone number indicated below.

It is requested that this application be passed to issue with claims 1-35, and 51-55.

Respectfully submitted,

Date: March 14, 2007



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